



Red Knot *rufa* subspecies (Northeastern South America wintering population)

Photo: © Raymond Bellumaur



Scientific name

Calidris canutus rufa

Taxon

Birds

COSEWIC status

Special Concern

Canadian range

Nunavut, Northwest Territories, Alberta, Saskatchewan, Manitoba, Ontario, Quebec, New Brunswick, Nova Scotia, Prince Edward Island, Newfoundland and Labrador

Reason for designation

This medium-sized shorebird breeds in the central Canadian Arctic and migrates long distances to overwinter on the northeastern coast of South America, centred in northern coastal Brazil. Overall numbers appear to be stable, with an estimated wintering population of about 19,800 mature individuals. During migration, the population congregates at key sites on the eastern seaboard of the United States, where it is vulnerable to threats from human harvesting of Horseshoe Crab (whose eggs are an essential food source for northbound migrants) in Delaware Bay, disturbance and predation from recovering falcon populations, and disturbance from

recreational activities. Risks from exposure to storms and severe weather during long migratory flights may increase with climate change.

Wildlife Species Description and Significance

Red Knot (*Calidris canutus*) is a medium-sized shorebird with a typical “sandpiper” profile: medium-long bill and smallish head, longish legs, and long tapered wings giving the body an elongated streamlined profile. In breeding plumage, the face, neck, breast and much of the underparts are rufous red. The upperparts are dark brown or black spangled with rufous and grey. In winter plumage, knots (used throughout to refer to Red Knots in general) have white underparts and pale grey back.

Red Knot is a “flagship” species for shorebird conservation, with long, inter-continental migrations and high vulnerability to threats, as it concentrates in large numbers at a few key sites on migration and in winter. It crosses many international boundaries and is symbolic of the need for international cooperation for successful conservation. Conservation of sites used by knots also benefits many other shorebird species

Distribution

Six subspecies of Red Knot are currently recognized worldwide, each with distinct biogeographical populations that differ to varying degrees in distribution, in scheduling of the annual cycle, and genetically. Three subspecies occur in Canada: *C. c. islandica*, *C. c. roselaari*, and *C. c. rufa*. The taxonomy of North American Red Knot populations has been revised since the 2007 COSEWIC Status Report, with the populations wintering in Tierra del Fuego, as well as those wintering in northern Brazil and in

southeastern USA / Gulf of Mexico / Caribbean, which were formerly assigned to *C. c. roselaari*, all now regarded as part of *C. c. rufa*. These three populations of *rufo* are also treated here as separate designatable units (DUs). Red Knot *rufo* subspecies (Northeastern South America wintering population) breeds in the central Canadian Arctic, and winters on the northeastern coast of South America, centred in the Maranhão district of northern Brazil.



Extent of occurrence (EOO) for Red Knot *C. c. rufa* (DUs 3, 4, and 5) in Canada, based on the known breeding range of the subspecies within the central Canadian Arctic

Source : COSEWIC. 2020. COSEWIC assessment and status report on the Red Knot *Calidris canutus*, *islandica* subspecies (*Calidris canutus islandica*), *roselaari* subspecies (*Calidris canutus roselaari*) and *rufo* subspecies (*Calidris canutus rufa*) in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xxv + 173 pp.

Habitat

Red Knot nests in barren habitats in the Arctic, such as windswept ridges, slopes, or plateaus, with little vegetation cover. On migration and wintering areas, knots use coastal areas with extensive sandflats, mudflats and rocky flats, where birds feed on bivalves and other invertebrates. Along the mid-Atlantic coast of the eastern United States, they use sandy beaches and feed on high-energy Horseshoe Crab eggs. They also use salt marshes, brackish lagoons, mangrove areas, mussel beds, peat banks,

rocky intertidal platforms, inland saline lakes, and agricultural fields.

Biology

Red Knot is monogamous, with pairs usually laying a single clutch of four eggs in the latter half of June, and the eggs hatching about mid-July. Females depart soon thereafter, leaving the males to accompany the young until they fledge. Breeding success varies considerably, depending on weather and the abundance and impacts of predators. Red Knot has comparatively high adult annual survival, ranging from 0.62-0.92 (mean 0.80), which varies in response to foraging and weather conditions on wintering grounds and during migration. Red Knot has a generation time of about 7 years, and most individuals start breeding at age two years.

Red Knot undergoes significant physiological changes during migration, to increase flight efficiency and permit rapid accumulation of body stores after reaching the breeding grounds. Organs and tissues involved in flight increase in size, while digestive organs and leg muscles decrease. Stores of fat and protein remaining on arrival on the breeding grounds are then used to regrow the latter organs in preparation for the breeding attempt.

Population Sizes and Trends

Some 32,500 Red Knots of all ages were found on the northeastern coast of Brazil during aerial surveys in 2019. This total was considerably higher than on previous surveys, although the difference likely reflects improved methodology designed specifically for Red Knots. Numbers overall appear to be relatively stable or fluctuating slightly, with an estimated population of about 19,800 mature individuals wintering in northeastern South America.

Threats and Limiting Factors

Many of the key threats to Red Knot are associated with its long-distance migrations and physiological changes that maximize flying efficiency and breeding success. Its relatively inflexible life history strategy makes Red Knot particularly sensitive to the effects of human interventions and changing climate and habitat conditions. Threats affecting all five DUs to varying extents include ecosystem modifications/biological resource use which affect food resources needed at critical times of the year (e.g., Horseshoe Crab harvest in Delaware Bay, Grunion fishery in Mexico), habitat shifting and alteration (e.g., climate change effects on habitat conditions and predator relationships on the breeding grounds), and changes to coastal habitats resulting from sea-level changes. Significant disturbance from human activities occurs in many areas, and most DUs are affected by increased predation or disturbance from increasing falcon populations. Oil spills pose a threat to all DUs. Increased frequency and intensity of storms on the breeding grounds, and hurricanes in migration areas, may periodically cause significant mortality, especially for those DUs that undergo long trans-oceanic migratory flights.

Major threats include ongoing issues with Horseshoe Crab abundance in Delaware Bay, increased predation and disturbance from increasing falcon populations, and possible effects from climate change, including increasing storm frequency on breeding grounds (habitat alteration, predation) and on migration and wintering areas (e.g., sea-level rise).

Protection, Status and Ranks

Red Knot is protected in Canada under the *Migratory Birds Convention Act* (1994). It was listed on Schedule 1 of the *Species at Risk Act* in 2012, as follows: *C. c. rufa* Endangered (the southern Tierra del Fuego / Patagonia wintering population, now DU3); *C. c. roselaari* Threatened (including present DU2, the

northeastern South America wintering population in northern Brazil and the southeastern USA / Gulf of Mexico / Caribbean wintering population, DU4 and DU5, now believed to be *C. c. rufa*), and *C. c. islandica* (now DU1) Special Concern (the previous DUs reflect earlier taxonomic designations). Red Knot (*C. c. rufa*) is also listed under species-at-risk legislation in Ontario, Quebec, New Brunswick, Nova Scotia, and Newfoundland and Labrador. *C. c. islandica* and *C. c. roselaari* are not listed under provincial or territorial species-at-risk legislation.

Red Knot (*C. c. rufa*) is listed federally in the United States as Threatened, and as Threatened in New Jersey and as of Special Concern in Georgia. *C. c. rufa* was added to Appendix 1 of the Convention on Migratory Species in 2005. Red Knot was listed as Critically Endangered on the Brazilian list in 2014 and categorized as Endangered in Argentina, Chile and Uruguay. France declared the species to be protected in Guadeloupe and Martinique in 2012 and in French Guiana in 2014. *C. c. roselaari* has been designated as Endangered in Mexico and as a species of management concern in the United States.

NatureServe lists *C. c. rufa* globally as G4T1, nationally in Canada as N1B and N1N, and nationally in the United States as N1N. It ranks *C. c. rufa* as S1 to S3 in Northwest Territories, Ontario, Quebec, Saskatchewan, Prince Edward Island, Nova Scotia, New Brunswick, and Newfoundland in Canada, and in Virginia in the United States. *C. c. islandica* is ranked N3B nationally and S2B in Northwest Territories.

Source: COSEWIC. 2020. COSEWIC assessment and status report on the Red Knot *Calidris canutus*, *islandica* subspecies (*Calidris canutus islandica*), *roselaari* subspecies (*Calidris canutus roselaari*) and *rufa* subspecies (*Calidris canutus rufa*) in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xxxv + 173 pp.

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